CORRESPONDENCE

Comments on "Influence of Location, Population, and Climate on Building Damage and Fatalities due to Australian Bushfire: 1925–2009"

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ABSTRACT

The absence of an upward trend in normalized building damage in Australian bushfires may reflect reduced vulnerability (due to improved weather forecasts and other factors) offsetting increases in the frequency or intensity of bushfires.

Crompton et al. (2010) examine trends in bushfire damage in Australia after normalizing historical damage data to take into account increases in building numbers (i.e., to estimate building damage had bushfires in earlier years occurred under the societal conditions of 2008/09). They find no upward trend in normalized damage and therefore conclude that "...there is no discernable evidence that the normalized data are being influenced by climate change due to the emission of greenhouse gases." However, their normalization does not take into account several factors that may have led to a reduction in vulnerability over the period they examined. Each of these factors, in the absence of an upward trend in the intensity or extent of bushfires, might have been expected to result in a decline in the normalized damage from bushfires.

For instance, Crompton et al. (2010) do not factor the increasing urbanization of Australia into their normalization of damage. They normalize the time series of building damage by using changes in the total numbers of buildings across an entire state, without taking into account that the proportion of the state population residing in the capital city has increased substantially over time. In 1958 about 45% of the population of the State of Victoria lived outside the capital city Melbourne. By 2008 this proportion had fallen to about 25%. Presumably this means that, over several decades, the number of buildings outside the capital city has fallen relative to the total numbers of buildings in the state. Apart from those residing on the very fringe of the city, capital city populations (and the houses in which they live) are far less vulnerable to bushfires than are buildings in small towns or isolated communities. The increasing urbanization of southeast Australia over the past 50 years or more might well have led to a decline in the number of buildings damaged by bushfires, unless another factor was operating to offset this decline.

Crompton et al. (2010) also do not take into account possible reductions in vulnerability due to improved building construction and/or regulation. After every major bushfire disaster official enquiries considered what could be done to reduce future vulnerability and recommend actions. As well, individual householders may install systems to reduce bushfire vulnerability (e.g., spray systems to wet houses prior to and during fire attack). Any activities in response to previous bushfire disasters, whether through official changes in building or planning regulations or autonomous actions by householders to reduce building vulnerability, would presumably have led to a decline in bushfire damage, unless the decline in vulnerability was offset by some other factor.

Neither do Crompton et al. (2010) take account of possible reductions in vulnerability due to improved emergency preparations and response, such as improved fire-fighting equipment and management. We should include here the reduced vulnerability that might have resulted from substantial improvements in the skill of weather forecasting over several decades (Nicholls 2001;

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Stern 2008). Such improved forecasts, available with much longer lead times than were possible in the past, could have allowed building owners to prepare more effectively (e.g., by removing fuel from the immediate environs of the building). It seems possible that such systems might have reduced vulnerability, and thus led to a decline in bushfire damage (unless other factors were increasing the threat of bushfire damage).

The above discussion indicates that there are several factors that might have reduced vulnerability to bushfires over the 1925–2009 period examined by Crompton et al. (2010). Any of these factors could have, in the absence of factors increasing the threat of damage, led to a reduction over decades in the damage caused by bushfires. Thus the absence of a decline in normalized damage may reflect an increased threat (perhaps due to a trend toward more frequent or more intense fires) offset by a decrease in vulnerability to fire. Of course, it is feasible that increasing urbanization, improved building/planning standards and techniques, improved emergency planning and response, and improved weather forecasts have not had any success whatsoever in reducing economic vulnerability to bushfires. But until research demonstrates that such decreased vulnerability has not occurred it would be safer to add a caveat to the conclusions of Crompton et al. thus: "...there is no discernable evidence that the normalized data are being influenced by climate change due to the emission of greenhouse gases (*assuming that increasing urbanization, improved building/planning standards and techniques, improved emergency/bushfire planning, equipment and response, and improved weather forecasts have had no effect in reducing economic vulnerability to bushfires*)."

REFERENCES

Crompton, R. P., K. J. McAneney, K. Chen, R. A. Peilke Jr., and K. Hayes, 2010: Influence of location, population, and climate on building damage and fatalities due to Australian bushfire: 1925–2009. *Wea. Climate Soc.,* **2,** 300–310.

Nicholls, N., 2001: Atmospheric and climatic hazards: Improved monitoring and prediction for disaster mitigation. *Nat. Hazards,* **23,** 137–155.

Stern, H., 2008: The accuracy of weather forecasts for Melbourne, Australia. *Meteor. Appl.,* **15,** 65–71.